Proceedings of the Sixth Conference on
African Linguistics. OSU WPL 20.16-31 (1975)

Lenis Stops and the Origins of Volta-Comoe Consonant Mutation

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1. Introduction

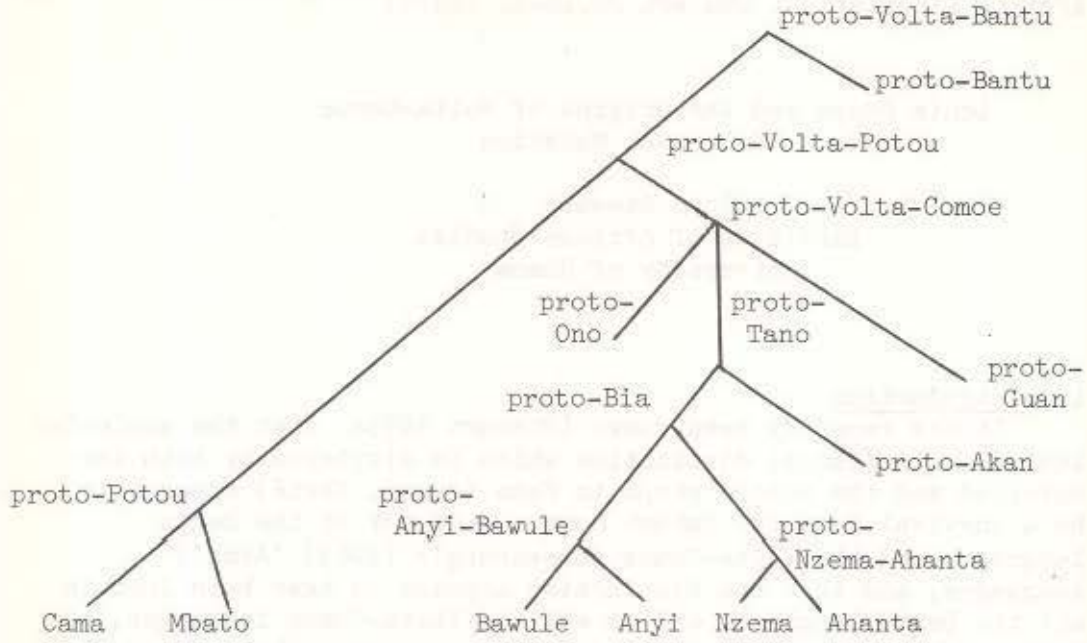
It has recently been shown (Stewart 1973a) that the nonlenis/lenis (fortis/lenis) distinction which is displayed by both the unvoiced and the voiced stops in Cama (Kyama, Ebrié) appears to be a survival from the latest common ancestor of the Bantu languages and the Volta-Comoe (Greenberg's (1963) 'Akan') languages, and that the distinction appears to have been lost in all the Bantu languages and in all the Volta-Comoe languages, but not, in the case of the Volta-Comoe languages, without first playing an important role in the conditioning of major soundshifts.

The major soundshifts postulated in pre-Volta-Comoe (more precisely, in Volta-Potou-to-Volta-Comoe; see below) are as follows (Stewart 1973a:21): (1) The (oral) unvoiced fortis stops become continuants, (2) The (oral) voiced fortis stops become unvoiced, (3) The oral lenis stops, both unvoiced and voiced, become fortis.

The purpose of this paper is to show that if these postulated soundshifts are reexamined in the light of the systems of morpheme-initial consonant mutation found in Nzema and other languages/dialects in the Bia subsubgroup of the Tano subgroup, in which morpheme-initial unvoiced fortes and voiced fortes commonly mutate to voiced fortes and voiced lenes respectively when not word-initial, it appears that in the case of the original (oral) voiced fortes and oral voiced lenes, the soundshifts did not, after all, occur in all positions and thereby completely eliminate the fortis/lenis distinction, but occurred in word-initial position only, and thereby gave rise to a consonant mutation system in which the fortis/lenis distinction played an important part.

The ancestral interrelationships which the relevant languages/dialects are here postulated as having may be represented by a tree diagram as in Figure 1.

Figure 1. Tree diagram.



Note 1: The bottom of the diagram represents the present time; the heights of the various proto-languages above the bottom, however, are not intended to represent relative time-depths. Very roughly, left-to-right along the bottom corresponds to west-to-east.
Note 2: It will be seen that the latest common ancestor of the Bantu languages, the Volta-Comoe languages and Cama is here called proto-Volta-Bantu. If Greenberg's classification is correct, this is to be identified with proto-Niger-Congo, but the writer suspects that it may not in fact go back quite so far (see Stewart 1973a:2).

The writer has investigated several of the Bia languages/dialects at first hand, though his data on Nzema is drawn from the work of others. He reported some time ago that "there remain in Ba[w]ule a few traces of a system of consonant mutation which is still vigorous in closely related languages or dialects such as Nzema" (Stewart 1956:364). He would now sum up the Bia situation by saying that the proto-Bia mutation system appears to have survived with extraordinarily little change in Nzema and with relatively little change in Ahanta, but that in Bia-to-Anyi-Bawule it apparently decayed considerably, becoming very much like the systems found in the various Anyi dialects examined, and that in Anyi-Bawule-to-Bawule it apparently decayed still further, to the point where it no longer was a mutation system, even though a few traces of it remained.

Under the circumstances it is natural to take Nzema as the sole representative of the Bia languages for the present purpose. Fortunately, a very detailed account of Nzema consonant mutation as it affects root morphemes in a variety of grammatical

circumstances is available in Chinebuah (1970); the account given below is based primarily on this, but also takes into consideration Welman (1925).

The system of transcription used here is that of Stewart (1973a); the main points to be noted are (i) that an initial apostrophe indicates lenisness, and (ii) that i̲,u̲,j,y,š^{y} are I.P.A. ɪ,ʊ,j̈,j,ç respectively and ž^{y} is the voiced counterpart of I.P.A. ç. The conventions adopted in the formulation of the P-rules follow those of Stewart (1973a) closely; it is important to note that all the binary features attributed to segments are strictly paradigmatic, quasi-paradigmatic features such as 'Vocalic' being disallowed.

2. Consonant mutation in Nzema

Mutation affects morpheme-initial consonants, and the following three mutation grades are recognized (though Chinebuah numbers the last two in the reverse order):

1. Unmutated[1] word-initial.
2. Mutated after a vowel.
3. Mutated after a homorganic nasal consonant. (It should be noted that a morpheme-initial consonant is never preceded by any consonant other than a homorganic nasal.)

The phonological conditioning, however, is not quite as regular as this suggests; for instance, in certain tense forms such as the present, the stem regularly takes Grade 1, while in certain others such as the past it regularly takes Grade 2, even though in these tense forms the stem may be either word-initial or preceded by a vowel, e.g.

Present: Grade 1	Past: Grade 2	Cf. Perfect: Grade 2
kofi ba Kofi comes	kofi 'ɣali̲ Kofi came	kofi ɛ'ɣa Kofi has come
ɔba he comes	ɔ'ɣali̲ he came	yi̲'ɣa he has come

Such deviations are evidently to be explained in part at least in terms of analogical simplification; it would appear, for instance, that in the present tense the stem-initial consonant may at one time have alternated between Grades 1 and 2 according to whether or not the stem was word-initial, and that the alternation may have been later eliminated analogically by the use of Grade 1 to the exclusion of Grade 2.

Chinebuah recognizes five types of consonant mutation, which with the help of the fortis/lenis distinction, which is not part of Chinebuah's framework, may be summed up as follows:

1. Z-mutation, in which Grade 1 is an unvoiced fortis and Grades 2 and 3 are the corresponding voiced fortis; where Grade 1 is a dorsal stop or affricate, however, there is no Grade 2; and, according to Welman (1925),

where Grade 1 is t, Grades 2 and 3 are not d but ɖ.

2. H-mutation, in which Grade 1 is an unvoiced fortis dorsal stop or affricate, Grade 2 is the corresponding continuant, and there is no Grade 3.
3. B-mutation, in which Grade 1 is a nondorsal voiced fortis, Grade 2 is an oral voiced lenis, and Grade 3 is a nasal voiced lenis.
4. P-mutation, in which Grade 1 is an unvoiced or voiced fortis and Grades 2 and 3 are identical to it; except in the case of kp and tp, however, unvoiced fortes take P-mutation only in very restricted grammatical circumstances; and nondorsal voiced fortes take P-mutation in Grade 3 only in very restricted grammatical circumstances.
5. R-mutation, in which Grade 1 is an oral or nasal voiced lenis and Grades 2 and 3 are identical to it, except that where Grade 1 is n Grade 2 is l̃.

It should be noted, however, (i) that Chinebuah looks upon his R-mutation, like his P-mutation, as strictly a zero mutation, and allocates n → l̃ to his B-mutation; and also (ii) that he allocates those voiced fortes which display zero mutation not to his P-mutation but to his R-mutation.

For the present purpose Chinebuah's Z- and H-mutations, which are clearly complementary, are treated as a single type, designated Z/H; historically, as will be seen, it appears that Chinebuah's H-mutation arose as a result of voiced fortis dorsal stops and affricates in Grade 2 becoming first continuant and then unvoiced. This gives two nonzero mutation types, Z/H and B, and two zero (strictly, zero or near-zero) mutation types, P and R. The main section of this paper shows the mutations of the two nonzero types, Z/H and B, to be derivable by natural P-rules from the voiced fortis (oral) stops and voiced lenis oral stops respectively of proto-Volta-Potou.

The unvoiced P-mutations appear to be derivable by natural P-rules from the unvoiced stops, both fortis and lenis, of proto-Volta-Potou; see the section on the contrast between Z/H-mutation and P-mutation below. The voiced P-mutations, on the other hand, appear to be the result of analogical changes from B-mutations; see the section on the emergence of the voiced P-mutations below. The R-mutations appear to be derivable by natural P-rules from the lenis continuants and nasals of proto-Volta-Potou; they will not be discussed further except in connection with the n → l̃ mutation.

The mutations of the two nonzero types (including four theoretical dorsal B-mutations which are presumed to have been replaced analogically with P-mutations in all circumstances), and the proto-Volta-Potou voiced stops from which they are derived in the main section of this paper, are as follows:

Number	Type	Proto-Volta-Potou	Grade 1	Grade 2	Grade 3
1	Z/H	b	f	v	v
2	Z/H	d	t	đ	đ
3	Z/H	jž	s	z	z
4	Z/H	g	k	h	g
4a	Z/H	g	cš	š	jž
5	Z/H	g^w	k^w	h^w	g^w
5a	Z/H	g^w	$cš^{yw}$	$š^{yw}$	$jž^{yw}$
6	B	'b (~m)	b	'ɣ	m
6a	B	'b (~m)	b	w	m
7	B	'd (~n)	đ	l	n
8	B	'g	g	*'ɣ	g
8a	B	'g	jž	*y	jž
9	B	$'g^w$	g^w	$*_w$	g^w
9a	B	$'g^w$	$jž^{yw}$	$*y^w$	$jž^{yw}$

A number of points must be noted here. Firstly, mutations 4a, 5a, 8a and 9a are merely variants of mutations 4, 5, 8 and 9 respectively; they have arisen as a result of what appears to be a Volta-Comoe-to-Tano soundshift 'palatalizing' dorsal consonants before high front vowels. Secondly, mutation 6a is merely a variant of mutation 6; rounded 'ɣ is disallowed, with the result that w occurs to the exclusion of 'ɣ before round vowels. Thirdly, as the oral/nasal alternations shown in the proto-Volta-Potou column are intended to indicate, the oral/nasal alternations in the nondorsal B-mutations between Grades 1 and 2 on the one hand and Grade 3 on the other appear to go right back to proto-Volta-Potou (see Stewart 1973a:7). In the derivation below, therefore, mutations 4a, 5a, 6a, 8a, and 9a are disregarded, and no P-rule is formulated to account for the nasality which characterizes Grade 3 in the nondorsal B-mutations.

3. The proposed derivation of the Nzema nonzero mutations from the voiced oral stops of proto-Volta-Potou

The Nzema nonzero mutations, in so far as they are derivable from the voiced oral stops of proto-Volta-Potou without recourse to the postulation of analogical simplification, are derivable by three P-rules in the Volta-Potou-to-Volta-Comoe (VP-VC) bundle, two in the Volta-Comoe-to-Tano (VC-T) bundle, and six in the Tano-to-Bia (T-Bi) bundle. The derivation is presented in summary form in the first instance in order to give an overall picture. It should be noted that the rule numbers differ from those of Stewart (1973a, 1973b).

	Z/H-mutation					B-mutation			
	1	2	3	4	5	6	7	8	9
Proto-Volta-Potou	b b b	d d d	jž jž jž	g g g	g^w g^w g^w	’b ’b m	’d ’d n	’g ’g ’g	$’g^w$ $’g^w$ $’g^w$
VP-VC. 3.	p b b	t d d	cš jž jž	k g g	k^w g^w g^w				
VP-VC. 4.						b ’b m	d ’d n	g ’g ’g	g^w $’g^w$ $’g^w$
VP-VC. 5.							d l n		
Proto-Volta-Comoe	p b b	t d d	cš jž jž	k g g	k^w g^w g^w	b ’b m	d l n	g ’g ’g	g^w $’g^w$ $’g^w$
VC-T. 1.			s z z						
VC-T. 2.	f b b								
Proto-Tano	f b b	t d d	s z z	k g g	k^w g^w g^w	b ’b m	d l n	g ’g ’g	g^w $’g^w$ $’g^w$
T-Bi. 1.	f v v	t ð ð							
T-Bi. 2.						b ’g m			
T-Bi. 3.				k ɣ g	k^w $ɣ^w$ g^w	b ’ɣ m		g ’ɣ ’g	g^w w ’g
T-Bi. 4.								g ’ɣ g	g^w w g^w

	1	2	3	4	5	6	7	8	9
T-Bi. 5.				k	k^w				
				h	h^w				
				g	g^w				
T-Bi. 6.		t							
		đ							
		đ							
Proto-Bia	f	t	s	k	k^w	b	d	g	g^w
	v	đ	z	h	h^w	ʾɣ	l	(ʾɣ)	(w)
	v	đ	z	g	g^w	m	n	g	g^w

The first two of the three VP-VC rules in the above derivation result of course from the revision of the three rules previously proposed (Stewart 1973a:21) to cover the major soundshifts in the bundle in question; these three rules, which have already been quoted in the Introduction, are now replaced with the following four (the first two of which affect only unvoiced consonants and thus play no part in the above derivation):

VP-VC. 1.

C
-Lenis
-Voiced
<+Labial>

→ +Continuant
<+Dental>

This rule states that in all positions unvoiced fortis stops are replaced with the corresponding continuants, except that labial p is replaced with labiodental f.

VP-VC. 2.

C
-Voiced
-Continuant

→ -Lenis

This rule states that unvoiced lenis stops become fortis in all positions.

VP-VC. 3.

R	C
+WdBdy	-Lenis
→	-Voiced

This rule states that voiced fortis stops become unvoiced in word-initial position.

VP-VC. 4.

	R	C
	+WdBdy	+Voiced
		-Continuant
		-Nasal
→		-Lenis

This rule states that voiced lenis oral stops become fortis in word-initial position.

The only remaining VP-VC rule is a revised version of one that has already been formulated (though not specifically allocated to VP-VC) in an account of final light syllables in disyllabic roots in Akan (Stewart 1973b P-rule Ak. 3); it is as follows:

VP-VC. 5.

	V	C	V
		+Coronal	
		-Dorsal	
		+Voiced	
		+Lenis	
→		+Lateral	

It states in effect that invervocalic 'd,n are replaced with l,l̃ respectively. The only difference from the earlier formuation is that the consonant is specified as +Lenis; the fortis/lenis distinction was not found to be relevant in the earlier study, in which root-initial consonants were disregarded.

This rule accounts not only for the change of the B-type mutation d ~ 'd ~ n to d ~ l ~ n but also for the change of the R-type (zero) mutation n ~ n ~ n to (nonzero) n ~ l̃ ~ n.

The first of the two Volta-Comoe-to-Tano rules unconditionally replaces c͡s̃,j͡z̃ with s,z respectively, and the second unconditionally replaces p with f. The second rule, as well as a less satisfactory version of the first, were first presented as supporting evidence for the validity of the Tano subgroup in Stewart (1966:44). The original version of the first rule unconditionally replaced ts with s; no voiced counterpart was mentioned, as it had been assumed that present-day z, which occurs only in Mutation Grades 2 and 3, was to be explained by a Tano-to-Bia rule which voiced noninitial unvoiced obstruents in certain circumstances; and the proto-Volta-Comoe sound had been assumed to be alveolar before Painter (1967:28) found the sound in the word for "water" (corresponding to Nzema nzule, Akan nsuo (Asante dialect), nsu (Fante and Akuapem dialects)) to be "a [voiceless] blade-alveolar affricate with an extensive place of articulation both at and somewhat behind the teeth ridge" in 28 out of 31 Guan idiolects investigated. With regard to the second rule, the writer failed to note in 1966 that the p was derived not only from proto-Volta-Potou 'p but also from proto-Volta-Potou (fortis) b; for examples of both these derivations see Stewart (1973a:26 and 28 (P-rule VC.T. 2 examples 1 and 18).

The two rules explain, of course, how it comes about that Z/H-type mutation is found not only where Grade 1 is an unvoiced stop but also where it is s or f.

The six Tano-to-Bia rules are as follows:

T-Bi. 1.	R	C
	-WdBdy	-Dorsal
		+Voiced
		-Continuant
		-Lenis
→		+Continuant
		+Dental

This rule states in effect that in word-medial position, and thus in Grades 2 and 3 but not in Grade 1, the fortis stops b,d are replaced with the fortis continuants v,ð respectively.

T-Bi. 2.	C
	-Continuant
	-Nasal
	-Lateral
	+Lenis
→	-Labial
	+Dorsal

This rule states that a lenis nonlateral oral stop becomes dorsal and nonlabial if it is not dorsal and nonlabial already. The only sound affected is ʾb, which in the mutation system occurs only in Grade 2; it becomes ʾg and thereby merges with existing ʾg.

T-Bi. 3.	R	V	C
	+WdBdy		+Dorsal
			+Voiced
			-Nasal
→			+Continuant

This rule states that after a word-initial vowel, an oral voiced dorsal stop, whether fortis or lenis, is replaced with the corresponding continuant. Its effect on the mutation system is to replace g,jž,g^{w},jž^{yw},ʾg,ʾj,ʾg^{w},ʾj^{yw} with ɣ,ž,ɣ^{w},ž^{yw},ʾɣ,y,w,y^{w} respectively in Grade 2. (The rule in fact replaces the affricates jž etc. with žž etc., but as double syllable-initial consonants are disallowed they are automatically reduced to ž etc. The rule also replaces ʾg^{w} with ʾɣ^{w}, but, as has already been noted, this is disallowed and automatically replaced with w.)

T-Bi. 4.

C
-Continuant
-Nasal
-Lateral

→ -Lenis

This rule states that lenis nonlateral oral stops are replaced with the corresponding fortis stops. The only sounds affected are 'g, 'j, 'g^{w}, 'j^{yw}, which in the mutation system occur only in Grade 3; they are replaced with g, jž, g^{w}, jž^{yw} respectively. (The rule in fact replaces 'j etc. with j etc., but as unaffricated fortis palatal stops are disallowed these are automatically replaced with jž etc.)

T-Bi. 5.

V C
+Dorsal
-Lenis
⟨-Coronal
+Continuant⟩

→ -Voiced
⟨-Dorsal⟩

This rule states that after a vowel a voiced fortis dorsal becomes unvoiced, and that if it is noncoronal and continuant it also becomes nondorsal. Its effect the mutation system is to replace ɣ, ž, ɣ^{w}, ž^{yw} with h, š, h^{w}, š^{yw} respectively in Grade 2.

T-Bi. 6.

C
+Coronal
+Dental

→ -Continuant

This rule states that a dental coronal continuant is replaced with the corresponding stop. The only sound affected is ð, which in the mutation system occurs only in Grades 2 and 3; it is replaced with d̲.

The most important effect of the Tano-to-Bia rules on the mutation system is the replacement of the stops with continuants (i) by T-Bi. 1 in Grades 2 and 3 in the case of the nondorsals, and (ii) by T-Bi. 3 in Grade 2 in the case of the dorsals. There is no direct evidence of the stop d having been replaced with the continuant ð, since present-day Nzema has the stop d̲ and all the other Bia languages/dialects examined also have stops; the dental articulation of the present-day Nzema sound, however, could not be so naturally explained without the postulation of an earlier ð. (The distinction between d and d̲ is not mentioned by Chinebuah (1970), but is reported on at some length by Welman (1925:13 and 15-16)).

The postulation of a stage (after T-Bi. 3) at which the fortis continuant ɣ was in contrast with the lenis continuant ʾɣ might conceivably appear implausible to some, but this contrast does in fact occur in present-day Ewe, which, like Nzema, is spoken in southern Ghana; see Ansre (1961:15) and Stewart (1973a:43-4). (In Ewe, ɣ,ʾɣ are orthographically 'h,ɣ' respectively.)

In the case of T-Bi. 3 the formulation of the context in which the change occurs, namely after a word-initial vowel, calls for some comment. The full facts, which T-Bi. 3 admittedly fails to capture, are perhaps covered most simply by saying that the change takes place in initial position in root morphemes, but the writer remains unconvinced of the legitimacy of any reference to the grammatical circumstances. The formulation as it stands does not account for instance for the fact that there is not a stop but a continuant in the second part of the reduplicated form cs̆is̆ɛ of cs̆ɛ "share"; it is necessary to postulate an analogical extension of the continuant to all contexts requiring Grade 2.

Three of the six Tano-to-Bia rules account not only for changes in the consonant mutation system but also for changes in the final light syllable system. In his 1973b study of final light syllables in a number of Volta-Comoe languages the writer derives Nzema kɛ ~ ke from proto-Tano bɛ ~ be as follows:

Proto-Tano (1973b).	bɛ ~ be
T-Bi (1973b). 3.	gɛ ~ ge
Bi-Nz (1973b). 2.	kɛ ~ ke

That study, however, takes no account of the fortis/lenis distinction, which, as has already been noted in connection with VP-VC. 5 above, was not found to be relevant. Now the only oral consonants postulated in final light syllables in proto-Tano (1973b) are b and l, and in the light of the present study of consonant mutation it appears (i) that the l is derivable by VP-VC. 5 from proto-Volta-Potou ʾd, and (ii) that the labial consonant was ʾb as a dorsal is then derivable from it by T-Bi. 2. The Nzema fortis unvoiced dorsal k thus appears, somewhat startlingly, to be derived from a proto-Tano lenis voiced labial ʾb. The Tano-to-Bia rules of the present study, however, numbers 2 and 5 of which are revised versions of the rules allocated to Tano-to-Bia and Bia-to-Nzema respectively in the earlier study, give the correct output as they stand:

	Initially in final light syllable	Cf. initially in root Grade 2			Grade 3
Proto-Tano	ʾb	ʾb	ʾg	g	ʾg
T-Bi. 2.	ʾg	ʾg			
T-Bi. 3.		ʾɣ	ʾɣ	ɣ	g
T-Bi. 4.	g				
T-Bi. 5.	k			h	
Proto-Bia	k	ʾɣ	ʾɣ	h	g

The cost of the whole derivation from proto-Volta-Potou to

Nzema, in terms of P-rules not yet found to be necessary to account for data outside the consonant mutation system, is thus extremely modest; there are only three such rules, namely the three Tano-to-Bia rules which change the value of the feature Continuant, and only one of these rules changes the value of a second feature.

4. The contrast between Z/H-mutation and P-mutation

The above derivation offers an explanation of what is perhaps the most striking aspect of Nzema consonant mutation, namely that where a root has an initial unvoiced fortis in its synchronically unmutated form (i.e. in its Grade 1 form),[2] it is not always possible to predict from its phonological structure whether it will take Z/H-mutation (a nonzero mutation) or P-mutation (a zero mutation); tu "dig", for instance, has the reduplicated form tudu (Z/H-mutation), whereas ti "tear" has the reduplicated form titi (P-mutation). Whereas the Z/H-mutation appears to be derived from proto-Volta-Potou voiced fortis stops, as has been seen, the P-mutation appears to be derived from proto-Volta-Potou unvoiced stops, both fortis and lenis; the derivations of the examples quoted illustrate:

	Z/H-mutation		P-mutation	
Proto-Volta-Potou	du	dudu	'ti	'ti'ti
VP-VC. 2.			ti	titi
VP-VC. 3.	tu	tudu		
Proto-Volta-Comoe, proto-Tano	tu	tudu	ti	titi
T-Bi. 1.		tuðu		
T-Bi. 6.		tudu		
Proto-Bia, Nzema	tu	tudu	ti	titi

The main explanation would appear to be, then, that VP-VC. 2 and VP-VC. 3 between them (the order in which they are given here is arbitrary) produced a merger in Grade 1 (the synchronically unmutated form) but not in the other grades.

The contrast between the two mutations in Nzema, it should be noted, has a very limited grammatical distribution; Chinebuah (1970:72-4) reports it as generally operating only in the reduplicated form of the verb root, though he does give one minimal pair showing it to be in operation in the verbal noun (p. 84). Thus ti "tear" or "pluck", for instance, which takes P-mutation in its reduplicated form, takes Z/H-mutation in the verbal noun (ɛdilɛ "plucking"; Grade 2) and in the present negative (ndi "does not pluck"; Grade 3); see Chinebuah (1970:83). The obvious explanation is the analogical replacement of P-mutation with Z/H-mutation in most grammatical circumstances in the case of those unvoiced consonants which take either Z/H-mutation or P-mutation in reduplication. With regard to the restriction to those unvoiced consonants which are unpredictable in reduplication, it should be noted that kp and tp, which, unlike the other unvoiced consonants, apparently take only P-mutation in reduplication, take P-mutation in many

(though not all) grammatical circumstances in which the other unvoiced consonants take only Z/H-mutation; see Chinebuah (1970: 72-4).

One would of course hope eventually to be able to quote comparative series of items which would demonstrate (i) the correspondence of Nzema verb roots taking Z/H-mutation in reduplication to reflexes in other languages of proto-Volta-Bantu verb roots with initial voiced fortes, and (ii) the correspondence of Nzema verb roots taking P-mutation in reduplication to reflexes in other languages of proto-Volta-Bantu verb roots with initial unvoiced fortes or lenes. The number of Nzema verb roots at present available for comparison, however, is very limited; Chinebuah gives only the following:

Z/H-mutation			P-mutation		
tu	tudu	dig	ti	titi	tear, pluck
su	suzu	measure	si	sisi	build
			sũã	suosũã	tear
kã	kĩhã	say	ka	kika	bite
csɛ	csisɛ	share	csi	csicsi	bind

Of these, only two have been found to have apparent cognates in either the Bantu languages or the Potou Lagoon languages: (i) tu "dig", which is almost certainly cognate with Akan tu "dig" or "pull", which in turn appears to be cognate with the reflexes in the Bantu languages of Guthrie's Common Bantu *-dụ̀t- "pull", and (ii) sũã "tear", which is probably cognate with Cama tuɛ "tear in pieces", though in this case not all the sound correspondences can be shown to be regular. The first example confirms the derivation proposed for the Z/H-mutation, the Common Bantu representation having d and not t. The second example confirms one of the two derivations proposed for the P-mutation, namely from proto-Volta-Potou unvoiced fortis stops: where the consonant is s in Nzema the P-mutation would sometimes be derived from proto-Volta-Potou t, which survives intact in present-day Cama but which is replaced with s in all positions by VP-VC.1.

5. The emergence of voiced P-mutations

As was noted earlier, the voiced P-mutations appear to be the result of analogical changes from B-mutations. The purpose of the present section is to indicate the main analogical changes which it is necessary to postulate, and to demonstrate their plausibility. The point of departure for the changes is of course not only the attested nondorsal B-mutations but also the theoretical dorsal B-mutations as generated by the above derivation, which are presumed to have been replaced with P-mutations in all circumstances.

In the case of the dorsals the postulated analogical change is from g ~ *'ɣ ~ g etc. to g ~ g ~ g etc. Two factors may be suggested as having probably contributed to precipitating this change.

Firstly, the replacement of 'b with 'g by T-Bi. 2 would have meant (i) the neutralization in Grade 2 of the contrast which is manifested as b/g in Grade 1, and (ii) a consequent incentive to avoid that neutralization by making Grade 2 the same as Grade 1 by analogy with the existing zero mutations. The significance of this factor would appear to be confirmed by the fact that except in the case of ba "come", Grade 2 is also the same as Grade 1 in all verb roots which have initial b in Grade 1.

Secondly, T-Bi. 4, by replacing 'g etc. with g etc., made Grade 3 the same as Grade 1; this was unparalleled elsewhere in the nonzero mutations but not of course in the zero mutations, and would naturally have favoured the analogical extension of zero mutation to Grade 2.

As for the nondorsals, it has just been seen that all verb roots but one which have initial b in Grade 1, just like all those which have initial dorsals in Grade 1, display zero mutation in Grade 2. This leaves the other nondorsal, namely d, as the only one of the voiced fortes which generally displays the regular nonzero B-mutation in Grade 2 in verb roots. It is not satisfactory, however, to discuss d without taking into consideration the fact that its nasal counterpart n also displays nonzero mutation in Grade 2, the Grade 2 forms of d and n being l and l̃ respectively; it will be recalled that in the above derivation P-rule VP-VC. 5 replaced intervocalic 'd,n with l,l̃ respectively, thereby causing a small spill-over of nonzero mutation from the B-type (displayed by d) to the R-type (displayed by n).

Even d,n display zero mutation in Grade 2 in certain very restricted circumstances; according to Chinebuah (1970:74-5), they display zero mutation in the reduplicated forms of CV and CVCV roots but not in those of CVV roots, e.g.

Unreduplicated		Reduplicated		Example from page
dɔ	weed	dudɔ	weed	83
die	receive	dielie	receive	81
nīã	look	nīɛl̃īã	look for	81

Almost certainly the explanation of the analogical change here is that l,l̃ occur with great frequency, and to the exclusion of d,n, in intervocalic position within roots, so that the reduplicated forms of CV roots with initial d or n, if they displayed nonzero mutation, would be subject to confusion with CVCV roots with medial laterals. The survival of nonzero mutation in the reduplicated forms of CVV roots is explained by the nonexistence of CVVCVV roots.

Chinebuah (1970:75 and 83) also notes one context in which he considers d to display zero mutation in Grade 3, namely "plural forms of singular nouns with a vowel prefix (e.g. ɛdãlɛ/ndãlɛ [examples retranscribed; dentality not of course shown in original; J.S.] 'cloth')." This, however, as will be clear in the light of the phonetic difference between the d of Grade 1 and the d̲ of Grades 2 and 3 which he does not recognize, is rather a matter of

a Z/H-mutation in which Grade 1 (which would of course be t) is not required, the singular and plural requiring Grades 2 and 3 respectively.

6. Conclusion

The postulation of distinctively lenis stops in proto-Volta-Bantu thus provides, as a bonus, a highly econominal explanation of the systems of consonant mutation found in Nzema and other languages/dialects of the Bia group: the Nzema system, which appears to have been inherited virtually unchanged from proto-Bia, is highly complex, but can nonetheless be derived almost in its entirety from the postulated proto-Volta-Bantu consonant system by an ordered set of articulatorily plausible P-rules of which all but three account for data outside the consonant mutation system as well as within it.

This of course strengthens the case for postulating the distinctively lenis stops in proto-Volta-Bantu, or at least in proto-Volta-Potou, and reinforces the writer's earlier claim (1973a:42-4) that the continued lack of understanding of the articulatory nature of the nonlenis/lenis distinction is a serious obstacle to the progress of the study of the Niger-Congo languages. It also demonstrates the importance of long-range comparison even where, as in the case of the Volta-Comoe languages, there is still a great deal of scope for short-range comparison: the Bia mutation systems appear to incorporate survivals of the non-lenis/lenis distinction even though this distinction seems otherwise to have been completely lost in the Volta-Comoe languages, so that it would not seem that short-range comparison restricted to languages within the Volta-Comoe group could possibly have provided a satisfactory explanation of the Bia situation.

Footnotes

[1]The Grade 1 forms, which are the ones which appear to have undergone the most crucial of the historical changes, are traditionally regarded as the unmutated forms for synchronic purposes. This on the face of it points to a case of 'rule inversion', a phenomenon that in recent years has been extensively debated by Schuh (1972, 1974) and Leben (1974). The question of whether or not the traditional treatment is justifiable, however, is outside the scope of this article.

[2]See footnote 1.

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